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# EMPLOYMENT:WOOD CONSUMPTION RATIOS FOR THE FOREST PRODUCTS INDUSTRY IN SUBAREAS OF OREGON AND WASHINGTON, 1976

by

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## Abstract

Presents and discusses employment:wood ratios for analyzing impacts on employment in forest products industries. 6

KEYWORDS: Employment (forest products industries), forest product output, mill operations/products.

This note presents employment:wood consumption ratios for major segments of the forest products industry in Oregon and Washington for the year 1976. These ratios can be used to estimate the impact of changes in levels of timber products output on employment in local areas (subareas); they also may be used to prepare management plans and environmental statements and to evaluate proposed legislation.

Employment:wood consumption ratios are based on several sources of data. Employment data by county, obtained from the Employment Security Department of the State of Washington and the Department of Human Resources of the State of Oregon, are for workers covered by unemployment

insurance, segregated by four-digit standard industrial classification (SIC) codes.<sup>1/</sup> Timber harvest data by county are from Lloyd (1978a, 1978b). Wood consumption data by industry and by county came from 100-percent canvasses of mills in 1976 by Howard and Hiserote (1978) and Bergvall et al. (1977).

Data were arrayed by subareas, which were the same as those used in the mill surveys:

| <u>Washington</u> | <u>Oregon</u> |
|-------------------|---------------|
| Puget Sound       | Northwest     |
| Olympic           | West central  |
| Lower Columbia    | Southwest     |
| Central           | Central       |
| Inland Empire     | Blue Mountain |

The counties in each subarea are listed in the appendix.

Employment data were summarized by subarea for the following categories:

- (a) SIC 2411--logging
- (b) SIC 2421--sawmills and planing mills
- (c) SIC 2435 and 2436--veneer and plywood plants.

Employment:consumption ratios are calculated by dividing the employment in each SIC category by the roundwood consumption for that industry. For example, there are 900 employees in eastern Oregon veneer and plywood plants. In 1976 these plants consumed 297.9 million board feet of timber. The resulting ratio is 3.02 employees per million board feet.

The calculations are based on consumption of roundwood. Thus, when other wood materials are used in the manufacturing process, and hence support employment, the resulting ratios are too high and cannot be used for impact analysis.

## DISCUSSION OF RESULTS

Table 1 shows the logging employment:timber harvest and the employment:wood consumption ratios by subarea for Oregon and Washington. The degree of manufacturing affects the ratios. The more processing lumber and plywood receive, the higher the ratio tends to be.

The highest logging employment ratio is 2.32 in the Puget Sound area of western Washington. The lowest logging employment ratio is 0.86 in the central part of eastern Oregon. Although why the ratios are so different is uncertain, logging methods differ in the two areas because of differences in timber types and sizes and in terrain.

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<sup>1/</sup>Source of SIC codes: Statistical Policy Division (1972).

Table 1---Logging employment:timber harvest and employment:wood  
consumption ratios by area and type of  
manufacturing process, 1976

(Number of employees per million board feet, Scribner scale)

| Half-State<br>and subarea | Logging<br>(SIC 2411) <sup>1/</sup> | Sawmills and<br>planing mills<br>(SIC2421) <sup>1/</sup> | Veneer and plywood<br>plants (SIC 2435 and<br>2436) <sup>1/</sup> |
|---------------------------|-------------------------------------|--|---|
| Western Washington:       |                                     |  |   |
| Puget Sound               | 2.32                                | 6.59   | NA  |
| Olympic Peninsula         | 2.19                                | 4.50   | NA  |
| Lower Columbia            | 2.25                                | 5.51   | 9.40  |
| Average                   | 2.23                                | 5.71   | NA  |
| Eastern Washington:       |                                     |  |   |
| Central                   | 1.58                                | 5.59   | NA  |
| Inland Empire             | 1.16                                | 5.35   | NA  |
| Average                   | 1.42                                | 5.49   | NA  |
| Western Oregon:           |                                     |  |   |
| Northwest                 | 2.00                                | 4.49   | <sup>2/</sup> 6.94  |
| West central              | 1.59                                | 4.50   | 7.05  |
| Southwest                 | 1.67                                | 4.96   | 6.86  |
| Average                   | 1.71                                | 4.65   | 6.94  |
| Eastern Oregon:           |                                     |  |   |
| Central                   | .86                                 | 5.90   | 3.27  |
| Blue Mountain             | 1.41                                | 4.65   |   |
| Average                   | 1.07                                | 5.39   |   |

NA = not applicable.

<sup>1/</sup>SIC = Standard Industrial Classification.

<sup>2/</sup>Multnomah County has been deleted.

The sawmill and planing mill employment ratio also shows variation among the subareas. No single variable appears to account for the variation. Differences can be expected because sizes of mills differ and some plants have operated longer than others. There is a higher degree of manufacturing in some subareas. And more company headquarters with their sizable staffs are located in some subareas than in others. Size of timber, types of machines, and productivity of labor are also factors that can affect the ratios and lead to real differences by subregion.

Variation was also found in the veneer and plywood employment ratios. How long a plant has been operating and the degree of manufacturing are important factors affecting the ratios. The low ratio in eastern Oregon reflects the fact that most plants produce only veneer and do not employ as many people as is usually associated with the plywood layup process.

The employment:wood consumption ratios for veneer and plywood in the Puget Sound and Olympic Peninsula and the average for western Washington are not shown because they appeared meaningless. Investigation of the wood consumption of the mills in these areas showed that the mills purchase veneer and lay it up; thus, roundwood is not the source of all wood consumed. The number of people employed depends in part on the amount of veneer purchased.

The veneer and plywood ratios for eastern Washington are not shown because employment data for one county were not available.

Over the past several decades, employment ratios have tended toward fewer employees per million board feet, primarily because of increases in labor productivity (Wall and Oswald 1975). A comparison with 1972 data for western Oregon shows that the logging employment ratio for 1976 (1.71) is higher than for 1972 (1.41) and the sawmill and planing mill ratio for 1976 (4.65) is higher than the 1972 ratio (3.84). The 1972 veneer and plywood ratio (7.85) is higher, however, than the 1976 ratio of 6.94.

Higher 1976 ratios for logging and sawmills and planing mills probably do not indicate a new upward trend in employment requirements, but they do show that labor productivity was lower in 1976 than in 1972. The industry production level was lower in 1976 than in 1972. Firms use labor inputs differently, depending on whether the economy is expanding or contracting--1972 was a high production year, and 1976 was a recovery year after a recession. Thus, a difference in productivity is not surprising.

When employment ratios are used for impact analysis, one must assume that the marginal changes in harvest or consumption require the same labor inputs as the average. This is usually not the case; but unless detailed mill studies are made, the average must be used to approximate change.

## CONCLUSION

Employment:wood consumption ratios can be calculated from the mill surveys.

Employment ratios vary considerably by subarea, representing differences in the industry, the timber, and the logging techniques. The exact cause of the variation could not be determined from this study. Some variation could be due to reporting errors in the mill surveys.

The subarea ratios can be used for employment impact analysis for local areas, but the distribution of the mix of wood consumption to sawmills and veneer and plywood plants must be estimated. The ratios by industry segment for a local area are not additive to get a composite ratio for the area.

Labor productivity dropped in western Oregon logging and sawmills and planing mills between 1972 and 1976; productivity in veneer and plywood plants rose.

These ratios are average ratios, and their use assumes they are the same as the marginal ratios. These ratios probably give the approximate magnitude of change in employment when the amount of timber harvested is changed.

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## APPENDIX

### Subareas in Counties of Washington and Oregon

#### Washington

##### Puget Sound

Island

King

Kitsap

Pierce

San Juan

Skagit

Snohomish

Whatcom

##### Olympic Peninsula

Clallam

Grays Harbor

Jefferson

Lewis

Mason

Pacific

Thurston

##### Lower Columbia

Clark

Cowlitz

Klickitat

Skamania

Wahkiakum

##### Central Washington

Chelan

Kittitas

Lincoln

Okanogan

Yakima

##### Inland Empire

Asotin

Columbia

Ferry

Pend Oreille

Spokane

Stevens

Walla Walla

#### Oregon

##### Northwest

Clackamas

Clatsop

Columbia

Hood River

Marion

Multnomah

Polk

Tillamook

Washington

Yamhill

##### West Central

Benton

Lane

Lincoln

Linn

##### Southwest

Coos

Curry

Douglas

Jackson

Josephine

##### Central

Crook

Deschutes

Jefferson

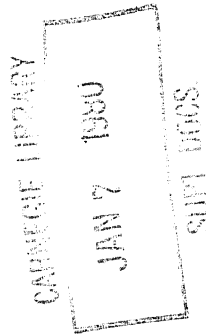
Klamath

Lake

Wasco

Wheeler





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